

-11-

CLAIMS

1. A control method of the parts constituting chain conveyors used in presses, which allows carrying out measurements on them while the conveyors are operating, with no  
5 physical contact with said parts, and whose accuracy is independent of the conveyor speed, comprising:

counting the pulses from a clock signal during the time the element to be measured is passing.

2. A control method of the parts constituting chain  
10 conveyors used in presses, which allows carrying out measurements on them while the conveyors are operating, measurements with adjustable tolerance and which allow carrying out a pass/no pass type control on the elements in motion constituting the chain conveyors used in presses, with no  
15 physical contact with said parts, and whose accuracy is independent of the conveyor speed, comprising:

configuring a measurement standard with two emitters arranged so that the spacing between them is equal to the measurement to be checked, including the tolerance, which is  
20 adjustable, which standard will be applied to the element to be controlled by means of an initializer.

3. A method according to claim 2, characterized in that said emitters are synchronized laser beam emitters and which are applied by the action of an initializer.

25 4. A method according to claim 2, wherein the measurement standard is applied in synchronization with the system clock signal.

5. A method according to claim 4, wherein the signals from the measurement standard emitters are out of phase, such that  
30 one is positive when the other one is negative, and wherein the system adds up the two signals, therefore, when the standard is applied to a part that is within tolerances, the two signals will cancel each other out, but when the allowance is excessive, the signal from the second emitter will be delayed, and after  
35 adding the two signals, there will be a resulting signal which will be used by the system to detect the allowance.

6. A method according to any one of the preceding claims,

**EXPRESS MAIL NO.:**  
**EV327549165US**

characterized in that it detects a change of status occurred in any of the components of the grippers when going from a standstill position to a working position, and in that its status is compared to what said component should have in the phase of the process in which the gripper incorporating the element involved is in.

7. A method according to any one of claims 1 to 6, characterized in that it detects if each one of said grippers is carrying its corresponding load or not, and in that it compares the result of said detection to what said component should have in the phase of the process in which the gripper incorporating the element involved is in.

8. A method according to any one of claims 6 or 7, characterized in that the result of said comparison is processed in the system control by means of a mathematic algorithm which filters the data, and in that a failure report is elaborated which identifies the grippers which have had failures and indicates the number of failures each one of them has had.

9. A method for controlling the total stretching produced in the conveyor chain or chains due to the accumulated wear of all the links, consisting of measuring the total chain length every so often, using the already disclosed direct measurement method, storing the data, comparing it to the preceding data to see how said magnitude evolves and statistically defining a tendency curve.

10. A control method of the tensioning system of the conveyor according to claim 9, consisting in that once the total conveyor length is determined and the number of links forming it is known, an average per-link measurement is determined and, once the setting margin of the tensioning device is known, a warning is automatically generated when it is convenient to remove a link in order to recover the setting margin of the tensioning device.

11. A method for controlling the wear of the support and guide wheels of press conveyors, consisting of measuring the diameters of each one every so often, using the already disclosed direct measurement method, storing the data, comparing

it to the preceding data to see how said magnitude evolves and statistically defining a tendency curve.

5        12. A preventive maintenance method for the links and support and guide wheels of press conveyors, consisting in that  
10       once the evolution of the wear that each one follows is known according to the method of claims 9 and 11, and once the value at which the element should be changed is set, the system will notify with the prior notice established when the element involved should be changed, based on the tendency curve data and  
10       on the estimated operation hours.